

## Patent Claims

- 5           1.     Device for microfluid analyses with a substrate with plane base and cover surfaces, wherein
- a chamber for receiving liquid comprising at least two admissions is integrated in the substrate, and
- 10           in the chamber a semipermeable or permeable membrane (3; 23) is arranged, the chamber being subdivided into two sectional chambers (2a; 2b) with at least one admission each by the membrane.
- 15           2.     Device according to claim 1, wherein the sectional chambers are at least partially arranged in parallel one to another.
3.     Device according to claim 1 or 2, wherein the sectional chambers are arranged in a plane in parallel or perpendicularly to the base surface of the substrate.
- 20           4.     Device according to one of the preceding claims, wherein the membrane is arranged at least partially in a plane in parallel or perpendicularly to the base surface of the substrate.
- 25           5.     Device according to one of the preceding claims, wherein the membrane is flexible, preferably elastic.
6.     Device according to one of the preceding claims, wherein the first sectional chamber comprises a grid (26).
- 30           7.     Device according to claim 6, wherein the membrane is arranged such that in case of a fluid flow from the second into the first sectional chamber it is partially or completely pressed against the grid.

8. Device according to claim 7, wherein the membrane is firmly provided between the first and the second sectional chambers.
- 5 9. Device according to claim 7, wherein the membrane is loosely arranged between the first and the second sectional chambers.
10. Device according to claim 9, wherein means (22) are provided which position the membrane such that it is partially or completely in the fluid flow.
- 10 11. Device according to one of claims 6, 7, 9 or 10, wherein the membrane is arranged such that it is partially or completely pressed against the base surface in case of a fluid flow from the first sectional chamber into the second sectional chamber.
- 15 12. Device according to one of claims 1 - 7, wherein the membrane is at least partially connected to the bottom of the chamber.
- 20 13. Device according to one of the preceding claims, wherein the substrate additionally comprises positioning means (24) for the membrane.
- 25 14. Device according to one of claims 1 - 7, wherein at least a part of the membrane is detachably arranged at a part of the chamber wall, in particular the bottom of the chamber, so as to planely lie against it.
- 30 15. Device according to one of the preceding claims, wherein the membrane comprises at least one pore, each pore having a pore diameter in a predetermined partial area of the area of 1 nm - 20  $\mu\text{m}$ , preferably 0.5  $\mu\text{m}$  - 20  $\mu\text{m}$ .
16. Device according to one of the preceding claims, wherein the chamber comprises at least four admissions, and the membrane subdivides the chamber into two sectional chambers with at least two admissions each.

17. Device according to one of the preceding claims, wherein at least one admission (28; 29) annularly surrounds the chamber.
- 5 18. Device according to one of the preceding claims, wherein the membrane and/or one chamber wall has a surface functionalization.
- 10 19. Device according to claim 18, wherein the surface functionalization comprises a coating, in particular with at least one polyelectrolyte film, an adhesion factor, a functional group, a biomolecule, a lipid membrane, a cell layer and/or a blocking molecule.
20. Device according to one of the preceding claims, wherein the substrate comprise plastics, in particular optically high-grade and/or optically non-transparent plastics.
- 15 21. Device according to one of the preceding claims, wherein the substrate comprises a covering element, in the base surface of which a recess for the chamber is provided.
- 20 22. Device according to claim 21, wherein the covering element is a cover plate (8).
- 25 23. Device according to claim 21, wherein the covering element comprises an intermediate plate (4) in which an opening (2b) for the chamber is provided, and a cover plate (1) which is provided for covering the opening on one side of the intermediate plate.
- 30 24. Device according to claim 22 or 23, wherein the membrane is arranged between the cover plate and the intermediate plate.
25. Device according to one of claims 21 - 24, wherein the substrate comprises a cover element (5; 9) for covering the recess.
26. Device according to claim 25, wherein the cover element is a plastic foil, in particular of optically high-grade plastics and/or with a thickness of 50  $\mu\text{m}$  to 1 mm.

27. Device according to one of claims 21 - 26, wherein the admissions end in the cover surface of the covering element of the substrate.
- 5 28. Device according to claim 27, wherein furthermore at least one liquid reservoir (7) is provided which is arranged on the covering element of the substrate and in which an admission ends.
- 10 29. Device according to claim 28, wherein the at least one liquid reservoir is of plastics, preferably the same plastics as the covering element in the area of the admission port.
- 15 30. Device according to claim 28 or 29, wherein the liquid reservoir and the covering element are formed in one piece in the area of the admission port.
31. Device according to claim 30, wherein the one piece is a molded part.
- 20 32. Device according to one of the preceding claims with a further chamber which is connected to one of the sectional chambers via a closable opening, and with a further admission, wherein in the further chamber a further membrane is arranged by which the further chamber is subdivided into two sectional chambers between the closable opening and the further admission.
- 25 33. Device according to one of the preceding claims, wherein the base and/or cover surface and/or membrane consists of an optically high-grade material which has autofluorescence as low as or lower than COC or COP.